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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Richard D. Granstein

Serial No.: 09/679,776

Art Unit: 1632

Confirmation No.: _____

Examiner: Q. J. Li

Filed: October 5, 2000

For: PROTECTIVE IMMUNITY OR IMMUNOLOGICAL TOLERANCE INDUCED
WITH RNA, PARTICULARLY TOTAL CELLULAR RNA

DECLARATION UNDER RULE 132

Hon. Commissioner of
Patents and Trademarks
Washington, DC 20231

Sir:

EXPRESS MAIL CERTIFICATE

Date 4/23/02 Label No. 0028721731-45

I hereby certify that, on the date indicated above, this paper or fee was deposited with the U.S. Postal Service & that it was addressed for delivery to the Assistant Commissioner for Patents, Washington, DC 20231 by "Express Mail Post Office to Addressee" service.

B.W. LEE
Name (Print)

B.W. Lee
Signature

I, Richard D. Granstein, declare that:

1. I am a citizen of the United States and reside in Scarsdale, New York.
2. I received an M.D. from the University of California School of Medicine in 1978.

3 I am currently the Chairman of Dermatology at Weill Medical College of Cornell University, New York, the assignee of the above-identified U.S. patent application, where I have been employed since 1995. My curriculum vitae is attached as Exhibit A. I am a specialist in dermatology and immunology.

4 I am the named inventor of the above-identified U.S. patent application.

5 I have read the Office Action dated November 23, 2001 and understand that the claims have been rejected as not enabled by the specification, specifically that the claimed invention can reduce tumor growth as well as inhibit tumor growth.

6 The following experiments using mouse tumor models performed by me or under my supervision demonstrate that the claimed invention can reduce growth in two different mouse tumor models.

A. Total cellular RNA vaccination after tumor challenge reduces the rate of S1509a tumor growth

- i. CAF₁ mice were inoculated with 1×10^6 live S1509a tumor cells.
- ii. Twenty-four hours after tumor challenge, the mice were vaccinated intradermally with 10 ug of S1509a total cellular RNA, prepared as described in the above-captioned specification, at each of two sites on the flank every 24 hours for three cycles.
- iii. Control animals were inoculated with 1×10^6 live S1509a tumor cells; twenty-four hours after tumor challenge, the mice were vaccinated intradermally with 10 ug of total cellular RNA derived from an unrelated NS cell line at each of two sites on the flank every 24 hours for three cycles.
- iv. The results are shown in Figure 1, attached as Exhibit B. The results show a significantly reduced rate of tumor growth in the mice vaccinated with S1509a total cellular RNA compared to control animals.

B. Total cellular RNA vaccination inhibits tumor growth of B16F0 murine melanoma

- i. C57BL/6 mice were immunized intradermally at weekly intervals with 20 ug of total cellular RNA derived from B16F0 murine melanoma (H-2^b), prepared as described in the above-captioned specification, at each of two sites on the flank three times.
- ii. The animals were challenged with 2×10^5 living B16F0 tumor cells.
- iii. The results are shown in Figure 2, attached as Exhibit C. The results show that mice immunized with total cellular RNA had significantly less tumor growth than the control mice immunized with medium alone.

7. I declare further that statements made in this Declaration are of my own knowledge and are true and that all statements made on information and belief are believed to be true and further these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 4/23/02


RICHARD D. GRANSTEIN

Richard D. Granstein, M.D.

.CURRICULUM VITAE

Name: Richard D. Granstein
 Address: 70 High Point Road, Scarsdale, New York 10583
 Place of Birth: Detroit, Michigan
 Education:
 1974 B.S. Massachusetts Institute of Technology
 1978 M.D. University of California, Los Angeles, School
 of Medicine

Postdoctoral Training:

Internship and Residencies

1978 - 1979 Intern in Medicine, Harbor-UCLA Medical Center,
 Torrance, California
 1979 - 1981 Resident in Dermatology, Massachusetts General
 Hospital, Boston, Massachusetts

Research Fellowships

1981 - 1982 Research Fellow, Cancer Biology Program,
 NCI-Frederick Cancer Research Facility,
 Frederick, Maryland
 1982 - 1984 Clinical and Research Fellow in Dermatology,
 Massachusetts General Hospital, Boston, Massachusetts

Licensure and Certification:

1979 Diplomate, National Board of Medical Examiners
 1979 California License Registration
 1981 Massachusetts License Registration
 1981 Maryland License Registration
 1983 Diplomate, American Board of Dermatology
 1985 Special Qualification, Dermatologic
 Immunology/Diagnostic and Laboratory Immunology
 1995 New York License Registration

Academic Appointments:

1979 - 1981 Clinical Fellow in Dermatology, Harvard Medical
 School, Boston, Massachusetts
 1982 - 1984 Clinical and Research Fellow in Dermatology, Harvard
 Medical School, Boston, Massachusetts
 1984 Instructor in Dermatology, Harvard Medical School,
 Boston, Massachusetts
 1984 - 1990 Assistant Professor of Dermatology, Harvard Medical

Richard D. Granstein, M.D.

1990 - 1996	School, Boston, Massachusetts
1996 -1997	Associate Professor of Dermatology, Harvard Medical School, Boston, Massachusetts
Medical School,	Lecturer in Dermatology, Harvard
1995 -	Boston, Massachusetts
Dermatology and	George W. Hambrick, Jr. Professor of
Medical College	Chairman, Department of Dermatology, Weill of Cornell University New York, New York

Hospital Appointments:

1984 - 1987	Assistant in Dermatology, Massachusetts General Hospital, Boston, Massachusetts
1984 - 1990	Assistant in Medicine (Dermatology), Children's Hospital Medical Center, Boston, Massachusetts
1987 - 1990	Assistant Dermatologist, Massachusetts General Hospital
1990 - 1995	Associate Dermatologist, Massachusetts General Hospital
1994 - 1995	Associate Chief of Dermatology for Research, Massachusetts General Hospital
York-Presbyterian Hospital (New York	1995 - Dermatologist-in-Chief, New
York, New York	Weill Cornell Campus), New

Other Professional Activities:

1985	Invited Lecturer, New England Dermatology Society,
1986	Providence, Rhode Island
Meeting of	Co-chairman, Photobiology Session, Annual
washington,	the Society for Investigative Dermatology,
1987	D.C.
Annual	Co-chairman, Immunologic Cytokines Session,
Dermatology,	Meeting of the Society for Investigative
1987	San Diego, California
Case	Visiting Professor, Department of Dermatology,
1987	Western Reserve University, Cleveland, Ohio
Francisco,	Invited Lecturer, Genentech, Inc., South San
1988	California
New York	Invited Lecturer, Department of Dermatology,
1989	University, New York, New York
Annual	Co-chairman, AAP/ASCI/AFCR/SID Joint Session,

Richard D. Granstein, M.D.

1989 Symposium,	Meeting of the American Federation for Clinical Research, Washington, DC Plenary Lecturer, 4th Immunodermatology
1989 Symposium	Amsterdam, The Netherlands Invited Lecturer, International Dermatologic
Federal	on Interferons and Related Cytokines, Berlin, Republic of Germany
1989-1994 Francisco, California	Consultant, Genentech, Inc., So. San
1990	Visiting Professor, Department of Dermatology, University of California, San Francisco School
of	Medicine
1990	Visiting Professor, Department of Dermatology
and	Medical Grand Rounds Lecturer, The University
of	Toronto, Sunnybrook Health Science Centre,
Toronto, Ontario	Invited Lecturer, Department of Dermatology,
1991	Palo Alto, California
Stanford University,	

Richard D. Granstein, M.D.

- 1991 Chairman, Growth Factors, Cytokines and Receptors
Minisymposium, Annual meeting of the Society for
Investigative Dermatology
- 1992 Guest Editor, *Chemical Immunology*
- 1993 Chairman, Symposium on Photoprotection, Dermatology
2000 Congress, Vienna, Austria
- 1993 Invited Lecturer, Department of Dermatology,
University of Muenster,
Muenster, Germany
- 1993 Co-Chairman, Minisymposium on Cytokines,
Tricontinental
Meeting of the Japan Society for Investigative
Dermatology, The
Society for Investigative Dermatology and the
European Society for
Dermatologic Research, Kyoto, Japan
- 1993 Invited Lecturer, Shiseido Co., Ltd.,
Yokohama, Japan
- 1994 Invited Lecturer, Year in Medicine, Clinical
Research Meeting
(AAP/ASCI/AFCR), Baltimore, Maryland
- 1994 Plenary Lecturer, New Trends in Immunopharmacology
1994, Tokyo, Japan
- 1994 Invited Lecturer for Grand Rounds, University of
Michigan Cancer
Center, Ann Arbor, Michigan
- 1995 Visiting Professor, Division of Dermatology,
University of California,
Los Angeles School of Medicine, Los Angeles,
California
- 1995 Invited Lecturer for Grand Rounds, Department of
Dermatology,
New York University School of Medicine, New York,
New York
- 1995 Invited Lecturer, Symposium on Photocarcinogenesis:
Mechanisms,
Models and Human Health Implications, Washington,
DC
- 1995- Consultant, Connetics, Palo Alto,
California
- 1996 Plenary Lecturer, Dermatology 2000 Congress,
Vancouver,
British Columbia, Canada
- 1996 Co-chairman, Symposium on Nerves, Neuropeptides and
the Skin,
Annual Meeting of The Cutaneous Biology Foundation,
Aspen, Colorado
- 1996 Dermatology 2000 Congress, Vancouver, British
Columbia, Canada
- 1996 Invited Lecturer, New York Biotechnology
Association, New York,
New York
- 1996 Invited Lecturer, Estee Lauder, Inc., Melville, New

Richard D. Granstein, M.D.

York
 1996
 Rounds, Invited Lecturer, Department of Dermatology Grand
 Albert Einstein College of Medicine, New York, New
 York
 1996- Consultant, Alza Corporation, Palo Alto,
 California
 1997 Invited Lecturer, Department of Surgery, New York
 Hospital-Cornell Medical Center, New York, New York
 1997 Invited Lecturer, Department of Hematology and
 Oncology Grand Rounds, Cornell University Medical
 College, New York, New York
 1997 Invited Lecturer, General Motors Cancer Research
 Foundation Annual Conference, Bethesda, Maryland
 1997 Invited Lecturer, Shiseido Co., Ltd., Yokohama,
 Japan
 1997 Visiting Professor, Department of Dermatology, Yale
 University School of Medicine
 1998 Invited Lecturer, Johnson & Johnson Skin Biology
 Research Center, Skillman, New Jersey
 1998 Invited Lecturer, Estee
 Lauder, Melville, New York
 1998 Invited Lecturer, Department of Dermatology, Duke
 University, Durham, North Carolina
 1998 Invited Lecturer, American Academy
 of Allergy, Asthma and Immunology, Washington, DC
 1998 Invited Lecturer, Department of Dermatology,
 University of Cincinnati, Cincinnati, Ohio
 1998 Invited Lecturer, Advances in Cancer
 Research, Cornell University Medical
 College, New York, New York
 1998 Invited Lecturer, Dermatology Foundation, Winter
 Dermatology Colloquium, Pebble Beach, California
 1998 Invited Lecturer, Atlantic Dermatological
 Conference, New York, New York
 1998 Invited Lecturer, Update Your Medicine Lecture
 Series, New York Hospital-Cornell Medical Center,
 New York, New York
 1998 Invited Lecturer, Seminars in Clinical Research,
 Rockefeller University, New York, New York
 1998 Invited Lecturer, Seventh Annual R. William Gange
 Lecture, Department of Dermatology, Massachusetts
 General Hospital, Boston, Massachusetts
 1998 Invited Lecturer, Department of Dermatology and
 Cutaneous Biology Grand Rounds, Thomas Jefferson
 University School of Medicine, Philadelphia,

Richard D. Granstein, M.D.

- 1999 Pennsylvania
Invited Lecturer, Visiting Scholar Program, Skin
Diseases Research Center, Department of
Dermatology, Columbia University, New York, New
York
- 1999 Visiting Professor, Department of Dermatology,
State University of New York Health Science Center
at Brooklyn, Brooklyn, New York
- 1999 Visiting Professor, Department of Dermatology,
University of Michigan Medical School, Ann Arbor,
Michigan
- 1999 Visiting Professor, Department of Dermatology,
University of Louisville, Louisville, Kentucky
- 2000 Invited Lecturer, Department of Dermatology, New
York Medical College, Valhalla, New York
- 2000 Plenary Lecturer at Annual Meeting of the American
Academy of
Dermatology, Dialogues in Dermatology, Reflections
on Our Past, Visions for Our Future - Dermatology
Research, San Francisco, CA
- 2000 Visiting Professor, Department of Dermatology,
Columbia University College
of Physicians and Surgeons, New York, New York
- 2001 Invited member, Extramural Roundtable on Skin,
NIAMS, Bethesda, Maryland
- 2001 Visiting Professor, Department of Dermatology,
University of Texas, Southwestern Health Science
Center, Dallas, Texas

Awards and Honors:

- 1965 Eagle Scout
- 1972 Associated Western Universities
Undergraduate Research Program
- 1973 Phi Lambda Upsilon
- 1978 Alpha Omega Alpha
- 1982 Dermatology Foundation Fellowship
Recipient
- 1983 National Research Service Award

Major Committee Assignments:

- 1986 - 1989 the Scientific Advisory Committee to
Research Mallinckrodt General Clinical
Center, Massachusetts General
Hospital, Boston, Massachusetts
NIH Site Visit Committee,
- 1987 Project Grant Review, New York
University, New York, New York
Radiation Safety Committee,
Massachusetts General
Hospital, Boston, Massachusetts
- 1988 - 1993

Richard D. Granstein, M.D.

1988 - 1991	Admissions Committee, Harvard Medical School,
1989 - 1993	Boston, Massachusetts
Massachusetts General	Committee on Research,
1989 - 1993	Hospital
	Subcommittee on Animal Care,
	Protocol Review Group, Massachusetts
	General Hospital, Boston,
1989 - 1993	Massachusetts
	Chairman, Subcommittee on Animal
	Care, Protocol Review Group,
	Massachusetts General Hospital,
	Boston, Massachusetts
1992 -	NIH Reviewers Reserve
1992	NIH Site Visit Committee, Program
	Project Grant Review, New York
	University, New York, New York
1992	Ad Hoc Reviewer, NIH General
	Medicine A1 Study
1994	Section, Naples, Florida
Medicine A1 Study	Ad Hoc Reviewer, NIH General
1995	Section, Washington, D.C.
Committee for	Chairman, External Advisory
for Special Surgery,	Evaluation of Research, Hospital
1996-	New York, New York
Committee to the Gene Therapy	Chairman, Advisory
Medical College,	Core Facility, Cornell University
1997-2000	New York, New York
College, Cornell	Committee of Review of the Medical
1997	University Medical College
Departmental Structure,	Ad Hoc Committee to Review
1998-2000	Cornell University Medical College
Chair of Department	Chairman, Search Committee for
Medical College	of Cell Biology, Cornell University
Memberships, Offices, and Committee Assignments in Professional Societies:	
1981-	American Society for Photobiology
1982-	Society for Investigative Dermatology
1983-	American Association for the Advancement of
Science	
1983-	American Academy of Dermatology
1984-1996	New England Dermatological Association

Richard D. Granstein, M.D.

1985-	American Federation for Clinical Research
1992-1995	Counselor, American Society for
Photobiology	
1994-	American Society for Clinical Investigation
1995-2000	Board of Directors, Society for
Investigative Dermatology	
1995-2000	Member, Committee on Long-range Planning
and Priorities,	
1995-	Society for Investigative Dermatology
1995-	Dermatologic Society of Greater New York
1995-	New York Academy of Medicine
1996-	Manhattan Metropolitan Dermatologic Society
1996-1997	New York Dermatological Society
Academy of Medicine	Secretary, Dermatology Section, New York
1997-2000	Member, Committee on Finances, Society for
	Investigative Dermatology
1997-1998	President, Dermatology Section, New York
Academy of Medicine	
1998-2000	Member, Skin Disease Research Agenda
Steering	
Dermatology	Committee, Society for Investigative

Editorial Boards and Editorial Positions

1991-	<i>Experimental Dermatology</i>
1992-1995	<i>Regional Immunology</i>
1992-1997	<i>Journal of Investigative Dermatology</i>
1996-	<i>The Journal of Cutaneous Medicine and</i>
Surgery	
1995-1998	Associate Editor, <i>Journal of Immunology</i>

Major Research Interests:

1. Immunodermatology and photoimmunology, especially studies on the role of the cutaneous immune system in the recognition or non-recognition of malignancies.
2. Studies on the immunobiology of Langerhans cells, the effects of and non-ionizing radiation on immunologic function in vitro and in vivo, and effects and roles of polypeptide cytokines, neuropeptides and stress on immune functions in the skin.
3. Ocular immunology with an emphasis on the morphology and function of resident immunocompetent cells in the eyes and the role of immunomodulatory molecules in ocular immunity.

Research Funding:

Past:

Richard D. Granstein, M.D.

1982-83	Dermatology Foundation, P.I.,
"PUVA-induced Skin	Cancer: Experimental and Clinical
Studies"	
1983-84	NIH, IF32 CA07014, Post-
doctoral Fellow	(Individual NRSA), "PUVA-induced
Skin Cancer:	Experimental and Clinical Studies"
1985-90	NIH, 1K08 AM01425, P.I.,
"Activation of	Suppression and UVR-induced Skin
Cancers"	
1985-86	William F. Milton Fund,
	P.I., "Use of Monoclonal
	Anti-interleukin 2 Receptor
	Antibody to Modulate
	Allogeneic Skin Graft Rejection and
	Graft versus
	Host Disease in Mice"
1987-90	NIH, R01 EY07782, P.I.,
"Ocular Cells in the	Activation of Immunity and
Suppression"	Genentech, Inc., P.I., "Treatment
1989-90	
of Keloids with	Gamma Interferon"
1992-98	NIH, R01 AR40667, P.I.,
"Epidermal Antigen	Presenting Cells and Tumor
Immunity"	
1994- 95	Dermatology Foundation,
P.I., "An Examination of	the Systemic Effect of Angelicin
plus Long-wave	Ultraviolet Radiation on Murine
Allograft Survival"	
Current:	
1994-	NIH, R01 AR42429, P.I., "Langerhans
	Cells and Nerves: Bidirectional
	Signaling"
1997-	NIH, R01 AR44240, P.I., "Regulation
of	Langerhans Cell Function"
1998-1999	Shiseido Co., Ltd., P.I.,
"Physiologic Responses to	Stress"

Teaching Experience:

1982 - 1996	Attending Physician, Dermatology Service,
Massachusetts	General Hospital, Boston, Massachusetts

Richard D. Granstein, M.D.

1983 - 1985 (continuing Boston,	Lecturer, Practical Dermatology Course medical education), Harvard Medical School, Massachusetts
1984 - 1994 Harvard	Lecturer, Pathophysiology of Skin Course, Medical School, Boston, Massachusetts
1985 - 1987 Harvard	Director, Pathophysiology of Skin Course, Medical School, Boston, Massachusetts
1986 - 1988 Course, Worcester,	Lecturer, Second Year Pathophysiology University of Massachusetts Medical School, Massachusetts
1989-1992 Meeting of the	Lecturer, Basic Immunology Course, Annual American Academy of Dermatology
1993 and Skin Cancer	Director, Focus Session on Langerhans Cells Annual Meeting of the American Academy of
Dermatology 1993 Annual	Lecturer, The Skin and the Nervous System, Meeting of the American Academy of
Dermatology 1994 Presenting Cells of the	Director, Forum on T Cells and Antigen Skin, Annual Meeting of the American
Academy of Dermatology 1994 - 1995 Course), Harvard	Lecturer, Immunology 200A (Graduate Medical School
1995 - New York Hospital-	Attending Physician, Dermatology Service, Cornell Medical Center, New York, New York
1996 Year Pathophysiology New York,	Director of Dermatology Section, Second Course, Cornell University Medical College, New York
1996 Cells in the Skin, Annual Dermatology, Washington,	Director, Forum on T Cells and Antigen Meeting of the American Academy of D.C.
1997 Cells in the Skin, Annual Dermatology,	Director, Forum on T Cells and Antigen Meeting of the American Academy of
1998 Cells in the Skin, Annual	San Francisco, California Director, Forum on T Cells and Antigen Meeting of the American Academy of

Richard D. Granstein, M.D.

Dermatology, Orlando,
Florida
1999 Lecturer, Forum on T Cells and Antigen
Cells in the Skin, Annual
Meeting of the American Academy of
Dermatology, Washington,
D.C.
2000 Lecturer, Forum on T Cells and Antigen
Cells in the Skin, Annual
Meeting of the American Academy of
Dermatology, San
Francisco, CA

Richard D. Granstein, M.D.

PUBLICATIONS - Richard D. Granstein, M.D.

I. Original Reports

1. Urist MR, Granstein RD, Nogami H, Svenson L, Murphy R. Transmembrane bone morphogenesis across multiple-walled diffusion chambers. *Arch Surg* 1977; 112:612-19.
2. Adrian RM, Murphy GF, Sato S, Granstein RD, Fitzpatrick TB, Sober AJ. Diffuse melanosis secondary to metastatic malignant melanoma. *J Am Acad Dermatol* 1981; 5:308-18.
3. Granstein RD, Morison WL, Kripke ML. The role of UVB radiation in the induction and elicitation of photocontact hypersensitivity to TCSA in the mouse. *J Invest Dermatol* 1983; 80:158-62.
4. Granstein RD, Morison WL, Kripke ML. The role of suppressor cells in the induction of murine photoallergic contact dermatitis and in its suppression by prior UVB radiation. *J Immunol* 1983; 130:2099-103.
5. Tominaga A, Lefort S, Mizel SB, Dambrauskas JT, Granstein RD, Lowy A, Benacerraf B, Greene MI. Molecular signals in antigen presentation. I. Therapeutic effects of interleukin 1 and 2 on ultraviolet radiation-treated antigen presenting cells in vivo and in vitro. *Clin Immunol Immunopathol* 1984; 29:282-83.
6. Granstein RD, Lowy A, Greene MI. Epidermal antigen presenting cells in activation of suppression: Identification of a new functional type of ultraviolet radiation-resistant epidermal cell. *J Immunol* 1984; 132:563-65.
7. Granstein RD, Tominaga A, Mizel SB, Parrish JA, Greene MI. Molecular signals in antigen presentation. II. Activation of cytolytic cells in vitro after ultraviolet radiation or combined gamma and ultraviolet radiation treatment of antigen presenting cells. *J Immunol* 1984; 132:2210-18.
8. Lowy A, Drebin JA, Monroe JG, Granstein RD, Greene MI. Genetically restricted antigen presentation for immunologic tolerance and suppression. *Nature* 1984; 308:373-75.
9. Granstein RD, Parrish JA, McAuliffe DJ, Waltenbaugh CR, Greene MI. Immunologic inhibition of ultraviolet radiation-induced tumor suppressor cell activity. *Science* 1984; 224:615-17.
10. Granstein RD. Epidermal I-J-bearing cells are responsible for transferable suppressor cell generation after

Richard D. Granstein, M.D.

- immunization of mice with ultraviolet radiation-treated epidermal cells. *J Invest Dermatol* 1985; 84:206-09.
11. Granstein RD, Greene MI. Splenic I-J bearing antigen presenting cells in activation of suppression: further characterization. *Cell Immunol* 1985; 91:12-20.
 12. Polla L, Margolis R, Goulston C, Parrish JA, Granstein RD. Enhancement of the elicitation phase of the murine contact hypersensitivity response by local ultraviolet radiation. *J Invest Dermatol*. 1986; 86:13-17.
 13. Granstein RD, Margolis R, Mizel SB, Sauder DN. In vivo inflammatory activity of epidermal cell-derived thymocyte activating factor and interleukin-1 in the mouse. *J Clin Invest* 1986; 77:1020-27.
 14. Granstein RD, Goulston C, Gaulton G. Prolongation of murine skin allograft survival by immunologic manipulation with anti-interleukin-2 receptor antibody. *J Immunol* 1986; 136:898-02.
 15. Granstein RD, Smith L, Parrish JA. Prolongation of murine skin allograft survival by the systemic effects of 8-methoxypsoralen and longwave ultraviolet radiation (PUVA). *J Invest Dermatol* 1987; 88:424-28.
 16. Granstein RD, Murphy GF, Margolis RJ, Amento EP. Gamma interferon inhibits collagen synthesis in vivo in the mouse. *J Clin Invest* 1987; 79:1254-58.
 17. Granstein RD, Askari M, Whitaker D, Murphy GF. Epidermal cells in activation of suppressor lymphocytes: further characterization. *J Immunol* 1987; 138:4055-62.
 18. Granstein RD, and Sauder DN. Whole-body exposure to ultraviolet radiation results in increased serum interleukin-1 activity in humans. *Lymphokine Res* 1987; 6:187-193.
 19. Latina M, Flotte T, Crean E, Sherwood ME, Granstein RD. Immunohistochemical staining of the human anterior segment: evidence that resident cells play a role in immunologic responses. *Arch Ophthalmol*. 1988; 106:95-99.
 20. Sharpe RJ, Margolis RJ, Askari M, Amento EP, Granstein RD. Induction of dermal and subcutaneous inflammation by recombinant cachectin/tumor necrosis factor (TNF alpha) in the mouse. *J Invest Dermatol* 1988; 91:353-57.
 21. Gallo RL, Kochevar IE, Granstein RD. Ultraviolet radiation induces a change in cell membrane potential *in vitro*: a possible signal for ultraviolet radiation induced alteration in cell activity. *Photochem Photobiol* 1989; 49:655-62.

Richard D. Granstein, M.D.

22. Gallo RL, Granstein RD. The inhibition of allergic contact dermatitis and ultraviolet radiation-induced tissue swelling in the mouse by topical application of amiloride. *Arch Dermatol* 1989; 125:502-56.
23. Granstein RD, Deak MR, Jacques SL, Margolis RJ, Flotte TJ, Whitaker D, Long FH, Amento EP. The systemic administration of gamma interferon inhibits collagen synthesis and acute inflammation in a murine skin wounding model. *J Invest Dermatol* 1989; 93:18-27.
24. Margolis RJ, Sherwood M, Maytum DJ, Granstein RD, Weinstock MA, Parrish JA, Gange RW. Longwave ultraviolet radiation (UVA, 320-400 nm) - induced tan protects human skin against further UVA exposure. *J Invest Dermatol* 1989; 93:713-18.
25. Granstein RD, Staszewski R, Knisely TL, Zeira E, Nazareno R, Latina M, Albert DM. Aqueous humor contains transforming growth factor beta and a small (<3500 daltons) inhibitor of thymocyte proliferation. *J Immunol* 1990; 144:3021-27.
26. Granstein RD, Rook A, Flotte TJ, Haas A, Gallo RL, Jaffe HS, Amento EP. A controlled trial of intralesional recombinant gamma interferon in the treatment of keloidal scarring: clinical and histologic findings. *Arch Dermatol* 1990; 126:1295-1302.
27. Gallo RL, Staszewski R, Sauder DN, Knisely TL, Granstein RD. Regulation of GM-CSF and IL-3 production from the murine keratinocyte cell line PAM 212 following exposure to ultraviolet radiation. *J Invest Dermatol* 1991; 97:203-9.
28. Grabbe S, Bruvers S, Gallo RL, Knisely TL, Nazareno R, Granstein RD. Tumor antigen presentation by murine epidermal cells. *J Immunol*, 1991; 146:3656-61.
29. Knisely TL, Anderson TM, Sherwood ME, Flotte TJ, Albert DM, Granstein RD. Morphologic and ultrastructural examination of I-A⁺ cells in the murine iris. *Invest Ophthalmol Vis Sci* 1991; 32:2423-31.
30. Knisely TL, Bleicher PA, Vibbard CA, Granstein RD. Production of latent transforming growth factor-beta and other inhibitory factors by cultured murine iris and ciliary body cell. *Curr Eye Res* 1991; 10:761-71.
31. Gallo RL, Grabbe S, Choi SS, Bleicher P, Granstein RD. Cyclosporin increases GM-CSF activity and gene expression in murine keratinocytes. *J Invest Dermatol* 1992; 98:274-8.
32. Grabbe S, Bruvers S, Lindgren AM, Hosoi J, Tan KC, Granstein RD. Tumor antigen presentation by epidermal antigen presenting cells in the mouse: Modulation by granulocyte-

Richard D. Granstein, M.D.

- macrophage colony stimulating factor, tumor necrosis factor- α , and ultraviolet radiation. *J Leuk Biol* 1992; 52:209-17.
33. Reppert SM, Weaver DR, Stehle JG, Rivkees SA, Grabbe S, Granstein RD. Molecular cloning of an orphan G protein-coupled receptor that is highly expressed in lymphocytes and proliferative areas of developing brain. *Mol Cell Neurosci* 1992; 3:206-14.
 34. Horvath KA, Granstein RD. PUVA augments cyclosporine A-mediated rat cardiac allograft survival. *J Surg Res* 1992; 52:565-70.
 35. Hosoi J, Egan CL, Lerner EA, Murphy GF, Grabbe S, Granstein RD. Regulation of Langerhans cell function by nerves containing CGRP. *Nature* 1993; 363: 159-63.
 36. Granstein RD, Morison WL, Kripke ML. Carcinogenicity of combined UVB radiation and psoralen/UVA radiation (PUVA) treatment of mice. *Photodermatology, Photoimmunology and Photomedicine* 1993; 9:198-202.
 37. Grabbe S, Gallo RL, Lindgren A, Granstein RD. Deficient antigen presentation by Langerhans cells from athymic (nu/nu) mice: Restoration with thymic transplantation or administration of cytokines. *J Immunol* 1993; 151:3430-39.
 38. Hosoi J, Grabbe S, Knisely TL, Granstein RD. Aqueous humor inhibits epidermal cell antigen presenting function. *Reg Immunol* 1993; 5: 279-84.
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Figure 1

Inhibition of tumor growth by intradermal RNA injection 24 hr after tumor challenge

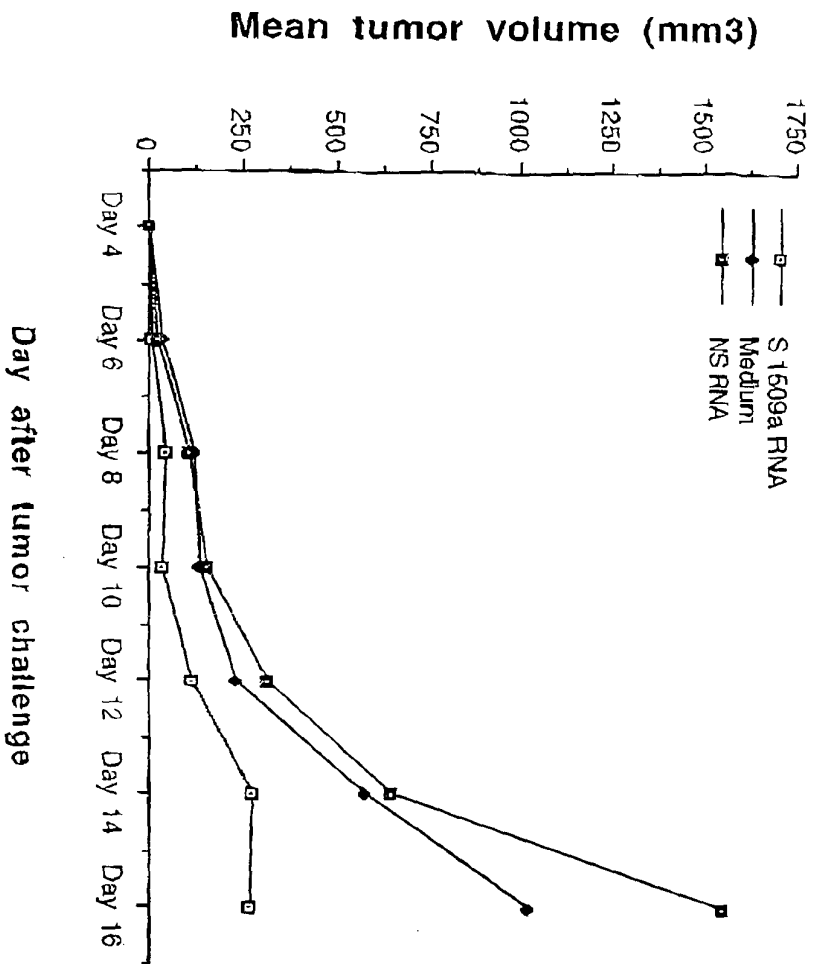


Figure 2

B16 tumor cell immunization (tumor growth)

